AIDS Brief

for sectoral planners and managers

Mining Sector

The HIV/AIDS epidemic is a global crisis which demands urgent attention and committed, sustained action by alliances of individuals, organisations and sectors. The AIDS Brief series has been developed to support the conceptualisation and implementation of key sectoral responses. The mining sector is recognised as having unique challenges and opportunities relating to the circumstances within which mining occurs and the nature of employment which is common within the sector.

BACKGROUND

Definition of the Mining Sector

Mining is defined as the extraction, dressing and treatment of naturally occurring minerals which are solids such as coal and ores, liquids such as crude petroleum, and natural gases.

The mining sector covers underground and surface mines, quarries and oil and gas wells as well as all supplemental activities such as crushing, screening, washing, cleaning, grading, milling, flotation, melting, pelleting, topping and any other activities required to render the minerals marketable.

Facts about the Mining Sector

Human beings have mined the earth for thousands of years. As early as 6 000 B.C. flint was mined for tools and weapons and by 3 000 B.C. tin and copper were being extracted. Today, leading mining countries are the United States, Russia, China, Saudi Arabia, Canada, Venezuela, Germany, Libya and South Africa.

Mining is a vital component of the national economies of numerous countries, particularly as a major foreign exchange earner. In classic development economies, it is the surplus generated from mining and agriculture and the related processes which stimulates economic growth and leads to the emergence of a modernised economy. In so-called "mineral economies" such as some countries in West Africa, 40% of exports and 10% of GDP may be generated from minerals.

The recent economic crisis in Asia has had a profound effect on base metal prices. Gold mining is in the doldrums since the price slipped to a 20 year low in 1999, and its future remains unclear, particularly in view of the possibility of large sales by certain countries and organisations. Oil prices are near historic lows.

Mining operations range from very small private enterprises, such as individuals panning for gold, to large multinational companies employing tens of thousands of workers. In 1998 there were over 650 international companies engaged in exploration for and production of metals and minerals. International mining companies spent about US$ 5 bn exploring for non-ferrous metals and minerals in 1997, Latin America being the favoured region. Services which support the mining industry include geological studies, environmental management and impact mitigation, research and development, project engineering and health, safety and risk assessment.

Mines are located where the minerals are, meaning that mining communities often exist in areas which are remote and inhospitable. Mines frequently operate as self-sufficient communities with housing, education, health care and entertainment provided. The health care or medical services range from first aid stations to fully equipped hospitals serving either the mine workers only or also the community surrounding the mine. The work is dangerous and occupational injuries and diseases as well as deaths are more common in mining than in other occupations. For example, the average gold miner has a one in forty chance of being killed and a one in three chance of suffering a reportable injury in a twenty-year mining career. Most countries have legislation which seeks to limit the risk of illness and injury by regulating the responsibilities of employers. Trade unions, where they exist, have traditionally played a prominent role in the mining industry, particularly in the areas of occupational safety and health.

Particularly in the developing world, the mining industry labour force is dominated by males. In fact, in some countries the employment of women underground is prohibited by law.

Migrancy, the disruption of social support mechanisms and family structures, unpleasant living conditions and limited opportunities for leisure define the working context for many mine workers. Many acknowledge that there is a link between migrancy, single-sex housing, and AIDS but unions frequently report difficulty in organising mine workers around HIV/AIDS. This results from lack of knowledge, complex forms of denial, feelings of powerless in the face of yet another disease in the context of high levels of disease and injury, and the stigma associated with being identified as HIV-infected. Research describes how, for mine workers, this lack of control over their life circumstances in general and their health in particular results in a risk-taking mentality which advocates high levels of sexual activity as a way of dealing with dangerous and stressful lives.

1. Labour

Labour is an essential input in mining and the sector's use of labour leads to unique risk situations in respect of HIV transmission because:

- in many mining situations mechanisation is difficult and the industry is very labour-intensive
- mine workers tend to be young males - an age category most affected by HIV/AIDS
- the use of migrant labour is common - which creates situations conducive to the establishment of new and/or casual sexual relationships
- apart from large numbers of semi-skilled workers, mines also require highly skilled and experienced professionals such as geologists and engineers - the illness or loss of these highly skilled professionals has the potential to disrupt operations significantly.

2. Health

The nature of mining requires peak physical fitness yet it is also associated with the risk of severe occupational illnesses such as pneumoconiosis, asbestosis, silicosis and tuberculosis (TB). Silicosis is a substantial risk factor for TB, as is HIV infection; research describes a multiplicative, rather than an additive effect of these three conditions.

- Silicosis is one of the most common industrial lung diseases, caused by the inhalation of dust containing a high concentration of silica particles. It occurs in miners employed in rock drilling, metal grinding, stone masonry and quarrying. Workers in countries where industries are less mechanised are at particularly high risk. In South Africa up to 20% of the men currently engaged in gold mining have radiological silicosis.
- Silicosis and overcrowded living conditions have been shown to be risk factors for TB (the risk of developing active TB is increased three-fold).
- In Southern Africa, mine workers have been found to have a much higher incidence of TB than the general population (1 000 - 2 000 TB cases per 100 000 population per year compared to about 240 per 100 000 in the general population).
- The dual epidemics of HIV and TB present special challenges to the mining sector. Among mine workers with HIV infection the risk of developing TB is increased five times.

STDs are an important co-factor for HIV transmission and rates of other STDs have, in many instances, been found to be higher amongst mine workers than in the general population. Although mines may provide STD treatment services for their workers, few provide treatment for their sexual partners and rapid re-infection is common.

Mine workers who become disabled as a result of advanced HIV disease are medically retired and frequently return home to remote rural areas where resources and care are limited. With their return, the flow of income to their household ceases, resulting in increased impoverishment.

3. Operations

Productivity - As the epidemic advances, productivity will be affected by the morbidity (illness) and mortality (death) of infected workers as well as early in the employment of replacement workers who are under training. Replacement of labour and additional training not only have implications for productivity but also carry their own inherent costs. In addition, productivity will suffer when workers take time off work to attend funerals or to care for sick family members or partners. Alternative work, such as "light duty" for infected workers who are unable to do their normal jobs, is not widely available because most jobs in the mines involve hard, physical labour. Staff morale is likely to be affected by the loss of colleagues, increased workloads and possibly also by the fear of infection.

Benefits - It is common for mine employers to provide benefits such as medical care, pensions, housing and death benefits to their workers - the cost of these benefits will increase with increasing numbers of infected workers.

Occupational exposure - Accidents and injuries are common in the mining industry and carry a small but not insignificant risk of blood-borne HIV transmission.

4. External interactions

Mining, like other sectors, operates in a global market which is highly competitive and sensitive to increases in production costs for whatever reason (including increases associated with HIV/AIDS such as morbidity and mortality). Foreign investors considering investment in a mining operation may be influenced by the HIV/AIDS situation in that country.

In addition to the impact of the epidemic on the viability of the sector, conditions in the mining sector, in turn, have the potential to increase the severity of the epidemic. These are situations where the risk of HIV transmission is increased - typically the sexual networks of the mine workers in the communities surrounding the mines and in the communities from where the miners are recruited and to which they return on leave or at the end of their contract periods.

Programme costs	Costs averted	Benefits to "local" and "sending" communities
Cost per STD case treated: (i) in miners (ii) in communities around the mines	Cost of treating HIV/AIDS in mine health facilities, including HIV-related tuberculosis	Estimated number of dependants per miner and the number of orphans averted
Cost per person reached by peer education	Expenditures on death benefits, funeral benefits, other compensation	Economic impact on 'sending' communities of remittances from mine workers
Cost per condom distributed	Productivity losses	Impact of reduced STD prevalence among sexual partners of mine workers in both communities
	Expenditures on recruiting, training, and acclimatising replacement workers	

IMPACT CHECKLIST

Internal Risk Profile

- ✓ Are mine workers:
  - (i) living in single sex quarters?
  - (ii) migrant?
  - (iii) aged between 25 and 45?
- ✓ Are there crucial workers in the production process?
- ✓ Are there readily available replacements for: (i) semi-skilled workers?
  - (ii) skilled workers?
- ✓ Is training: (i) flexible - to accommodate the inclusion of HIV/AIDS awareness and education?
  - (ii) structured towards multi-skilling?
- ✓ What recreational activities are available to mine workers?
- ✓ Are alcohol and drug use common?
- ✓ Will the company allowances for:
  - (i) sick leave
  - (ii) compassionate leave
  - (iii) funeral attendance

  be adversely affected by HIV/AIDS?
- ✓ How will HIV/AIDS affect benefits such as:
  - (i) medical aid, in-house and/or external medical services?
  - (ii) pension or other retirement schemes?
  - (iii) group life insurance?
  - (iv) disability and ill-health retirement?
  - (v) funeral benefits?
- ✓ Does the company have an existing HIV/AIDS workplace policy and programme?

External Risk Profile

- ✓ How many dependants (on average) does each mineworker support?
- ✓ Are the bulk of HIV infections:
  - (i) in the general population?
  - (ii) in identifiable risk groups, e.g. sex workers?
- ✓ What are the hotspots/risk environments in the surrounding community?
- ✓ Will the HIV/AIDS epidemic affect:
  - (i) the domestic market?
  - (ii) the international market for the minerals produced?

SECTORAL RESPONSE

An effective response is one which recognises those factors which determine individual and group susceptibility to HIV infection, as well as the features of the sector which are particularly vulnerable to the impact of the epidemic. It identifies situations of risk and, where possible, intervenes to reduce the risk. In the mining sector, the response should broadly aim to:

- address the broader social, cultural and community contexts that facilitate the spread of HIV, such as seeking alternatives to the traditional single sex living arrangements in order to provide a more "normal" home life for workers;
- provide for on-going consultation with worker representatives and trade unions to ensure joint ownership of all aspects of the response;
- co-ordinate existing HIV and STD prevention efforts and upgrade these where necessary, in particular ensuring that the sexual partners of mine workers receive good STD treatment to reduce the risk of re-infection;
- fill gaps in service provision;
- create alliances and partnerships among groups and stakeholders; and
- prepare for the impact of increasing numbers of infected workers.

The costing of interventions is often key to obtaining both management commitment and resources for an effective and sustained response. One model, detailed in the Table opposite, seeks to compare programme costs with costs averted (i.e. HIV infections prevented) and relates these to benefits to households and communities.

All mining companies should adopt an HIV/AIDS/STD/TB workplace policy which:

- expresses the company's commitment to addressing the epidemic;
- sets a foundation for the HIV/AIDS programme, entrenching the three cornerstones of prevention, care and non-discrimination;
- provides a framework for consistency of practice;
- expresses standards of behaviour expected of employees, supervisors and management;
- sets standards for communication about AIDS;
- lets employees know what assistance is available;
- defines the company's position in respect of community participation; and
- assures consistency with Government and international statutes.

An optimal workplace HIV/AIDS/STD/TB programme:

- reflects an understanding of the context of mine workers' lives
- takes account of how the sexuality and health-seeking behavioural norms of the mine workers are collectively negotiated and the choices that they are empowered to make
- recognises the resources that the mine workers have access to
- identifies priorities for action which are realistic, which exploit inherent resources and which will receive support from management, workers, clients and community leaders
- uses the power of peer education;
- provides training using participatory and skills-based techniques;
- increases self-efficacy amongst mine workers to improve the likelihood that they will engage in health-protective behaviours;
- works towards developing social contexts which are supportive of behaviour change;
- provides accessible resources, such as condoms.

An important element of the workplace programme is the health and wellness programme which should cover:

(i) First aid training and the provision of equipment at dressing stations, medical stations and mine hospitals to prevent occupational exposure to HIV and other blood-borne infections.

(ii) Support for early STD health-seeking behaviour and access to STD treatment, which includes counselling for risk reduction, condom promotion and provision, contact tracing and treatment using the syndromic approach with drugs of proven efficacy.

(iii) Access to HIV testing and confidential counselling.

(iv) Improved TB treatment compliance and completion, particularly reducing treatment failure associated with leave and irregular clinic attendance. (Although current thinking remains equivocal regarding the management of HIV-infected mine workers with preventive therapies such as INH to prevent TB, there is evidence to suggest that this is a cost-effective way of prolonging wellness and the workplace is an optimal place to provide such interventions as workers are readily available for monitoring and follow-up.)

AIDS is not just an issue for the workplace and companies should consider forming alliances and participating in community HIV/AIDS/STD/TB projects. This participation will increase the capacity of communities to deal with HIV/AIDS and will have benefits, not only for the projects, but also for the companies. Successful project participation:

(i) embraces the vision of the country's National AIDS Programme;
(ii) builds alliances, or partnerships, which operate across sectors and between public, private and non-governmental or community based organisations;
(iii) promotes health across sectors (e.g. health, welfare, housing) and across professional and lay boundaries;
(iv) co-ordinates attempts by different stakeholders to promote health-enhancing behaviour;
(v) facilitates the sharing of resources;
(vi) is responsive to cultural issues and addresses the broader determinants of health and well-being in a sustainable manner; and
(vii) involves local communities in setting agendas for action.

ACTION CHECKLIST

Management Strategies

✓ Commission a model of the epidemic within: (i) the company
(ii) the surrounding community
✓ Develop a profile of the workforce, identifying risk factors for HIV infection, such as:
(i) separation from primary partners
(ii) use of condoms
(iii) basic knowledge and awareness of HIV/AIDS
(iv) cultural practices (such as circumcision)
(v) drinking patterns
✓ Develop a profile of the community, describing sexual networking patterns
✓ Conduct an institutional audit to:
(i) establish production bottlenecks
(ii) identify key workers
(iii) establish productivity effects
(iv) define the effects on markets
✓ Estimate direct and indirect costs attributable to HIV/ AIDS including:
- absenteeism and sick leave
- morbidity → reduced production
- replacement recruitment
- retraining
- medical costs
- disability and ill health retirement
- pensions and dependent benefits
- funeral costs

✓ Conduct an assessment of the institutions that may be involved in any interventions, including:
(i) mine medical facilities: hospitals, clinics, outreach teams
(ii) mine social services: social welfare, church and recreational services
(iii) mine union services
(iv) extra-mine health services
(v) extra-mine social services
✓ Use the information to:
(i) serve as the base-line information for management/worker consultations
(ii) inform the content and focus of the workplace programme
(iii) guide medium and long-term strategic planning
✓ Develop long-term strategies to address risk factors such as single sex hostels and migrancy
✓ Develop a skills succession plan and initiate a multi-skilling programme for positions identified as critical to production
✓ Identify company resources which can be shared such as:
(i) skills in marketing
(ii) advertising and public relations
(iii) information technology
(iv) market research
✓ Demonstrate commitment to the workplace policy and programme from:
(i) management
(ii) trade unions
✓ Monitor the response by:
(i) documenting ill-health data
(ii) analysing absenteeism data to indicate trends.

SUMMARY

The mining sector operates in a global market which is highly competitive and sensitive to fluctuating mineral prices. The sector's unique use of labour and style of operations are both linked to an increased risk of HIV transmission. Understanding these however creates multiple opportunities for action to prevent new infections and to mitigate the effects of the epidemic.

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Useful contacts

UNAIDS; 20, avenue Appia, CH-1211 Geneva 27, Switzerland; tel: +4122 791 46 51; fax: +4122 791 4165; e-mail: unaids@unaids.org
CDC; 1600 Clifton Road, Atlanta, Georgia 30333, USA; tel: +404 639 3311 or +800 311 3435
HEARD website: http://www.und.ac.za/und/heard

Revised by Rose Smart
HIV/AIDS Consultant

Commissioning Editor:
Professor Alan Whiteside, Health Economics and HIV/AIDS Research Division, University of Natal, Durban, South Africa

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